

What is claimed is:

1. A radio-wave propagation characteristic forecasting system for performing ray launching for obtaining a passage time and an intensity when a structure having an edge, a transmission point,  
5 and a reception point are provided in an observation space defined in a three-dimensional space, a plurality of radio-wave rays is radiated from the transmission point at different angles, and the rays repeat reflection and transmission due to collision with the structure caused by their progress and pass the vicinity of  
10 the reception point while repeating the reflection and transmission; comprising:

ray spread defining means for defining a ray spread provided as a function of propagation distances from the transmission point to the rays;

15 distance calculating means for calculating the distance between each of the rays and the edge;

radius calculating means for obtaining a point on each of the rays and a point on an edge for deciding the distance and calculating a ray spread radius to the distance from the point  
20 on each of the rays up to the transmission point; and

diffracted-ray generating means for generating a plurality of diffracted rays by using the point on the edge as a diffraction point when the ray spread radius is equal to or larger than the distance between each of the rays and the edge.

2. The radio-wave propagation characteristic forecasting system according to claim 1, wherein

the ray spread defining means is defined as a function in which the radius of the ray spread increases as the propagation distance of each of the rays from the transmission point increases.

3. The radio-wave propagation characteristic forecasting system according to claim 1, wherein

the diffracted-ray generating means uses the line connecting the diffraction point with the transmission point, or a line connecting the diffraction point with a dummy transmission point obtained from a reflection point, transmission point, and diffraction point which are the closest to the rays as an incoming ray for generating the diffracted rays.

4. The radio-wave propagation characteristic forecasting system according to claim 1, wherein

the diffracted-ray generating means uses a crossing segment between the ray spread and the edge as an aggregate of diffraction points, assigns a predetermined number of diffracted rays in the collective region of diffracted rays generated by using the aggregate of the diffraction points as a wave source, and moreover assigns the ray spread to each diffracted ray.

5. The radio-wave propagation characteristic forecasting system according to claim 3, wherein

the diffracted-ray generating means assumes a plurality of virtual planes contacting with the edge, generates reflected waves respectively using the incoming ray as an incoming wave on each virtual plane, and uses these reflected waves as diffracted rays.

- 5    6.    The radio-wave propagation characteristic forecasting system according to claim 1, wherein

the means are executed in parallel every azimuth of a ray using the transmission point as a starting point.

7.    A radio-wave propagation characteristic forecasting method  
10    for performing ray launching for obtaining a passage time and an intensity when a structure having an edge, a transmission point, and a reception point are provided in an observation space defined in a three-dimensional space, a plurality of radio-wave rays is radiated from the transmission point at different angles, and  
15    the rays repeat reflection and transmission due to collision with the structure caused by their progress and pass the vicinity of the reception point while repeating the reflection and transmission; comprising:

- a ray spread defining step of defining a ray spread provided  
20    as a function of propagation distances from the transmission point to the rays;

a distance calculating step of calculating the distance between each of the rays and the edge;

- a radius calculating step of obtaining a point on each of  
25    the rays and a point on the edge for determining the distance

and calculating a ray spread radius to the distance from the point on each of the rays up to the transmission point; and

a diffracted-ray generating step of generating a plurality of diffracted rays by using the point on the edge as a diffraction point when the ray spread radius is equal to or larger than the  
5 distance between each of the rays and the edge.

8. The radio-wave propagation characteristic forecasting method according to claim 7, wherein

the ray spread defining step is defined as a function in  
10 which the radius of the ray spread increases as the propagation distance of each of the rays from the transmission point increases.

9. The radio-wave propagation characteristic forecasting method according to claim 7, wherein

the diffracted-ray generating step uses the line connecting  
15 the diffraction point with the transmission point, or a line connecting the diffraction point with a dummy transmission point obtained from a reflection point, transmission point, and diffraction point which are the closest to the rays as an incoming ray for generating the diffracted rays.

20 10. The radio-wave propagation characteristic forecasting method according to claim 7, wherein

the diffracted-ray generating step uses a crossing segment between the ray spread and the edge as an aggregate of diffraction points, assigns a predetermined number of diffracted rays in the

collective region of diffracted rays generated by using the aggregate of the diffraction points as a wave source, and moreover assigns the ray spread to each diffracted ray.

11. The radio-wave propagation characteristic forecasting  
5 method according to claim 9, wherein

the diffracted-ray generating step assumes a plurality of virtual planes contacting with the edge, generates reflected waves respectively using the incoming ray as an incoming wave on each virtual plane, and uses these reflected waves as diffracted rays.

- 10 12. The radio-wave propagation characteristic forecasting method according to claim 7, wherein

the steps are executed in parallel every azimuth of a ray using the transmission point as a starting point.

13. A computer-readable program for making a computer execute  
15 a radio-wave propagation characteristic forecasting method for performing ray launching for obtaining a passage time and an intensity when a structure having an edge, a transmission point, and a reception point are provided in an observation space defined in a three-dimensional space, a plurality of radio-wave rays is  
20 radiated from the transmission point at different angles, and the rays repeat reflection and transmission due to collision with the structure caused by their progress and pass the vicinity of the reception point while repeating the reflection and transmission; comprising:

a ray spread defining step of defining a ray spread provided as a function of propagation distances from the transmission point to the rays;

5 a distance calculating step of calculating the distance between each of the rays and the edge;

a radius calculating step of obtaining a point on each of the rays and a point on the edge for determining the distance and calculating a ray spread radius to the distance from the point on each of the rays up to the transmission point; and

10 a diffracted-ray generating step of generating a plurality of diffracted rays by using the point on the edge as a diffraction point when the ray spread radius is equal to or larger than the distance between each of the rays and the edge.